

REC'D 15 NOV 2000

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IPB/25852	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DK99/00034	International filing date (day/month/year) 25/01/1999	Priority date (day/month/year) 25/01/1999
International Patent Classification (IPC) or national classification and IPC H04R25/00		
Applicant PHOLM & WESTERMANN APS et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  18/12/1999	Date of completion of this report  13.11.2000
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Nieuwenhuis, P  Telephone No. +49 89 2399 8968



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/DK99/00034

## I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

### Description, pages:

1-15 as originally filed

### Claims, No.:

1-16 as originally filed

### Drawings, sheets:

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/DK99/00034

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes:	Claims 1-16
	No:	Claims
Inventive step (IS)	Yes:	Claims 1-16
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1-16
	No:	Claims

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**Re Item V****Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. The application relates to a hearing aid system (claim 1) and a hearing aid (claim 12) both adapted for in-situ fitting. The system of claim 1 comprises a hearing aid with a signal processor for generating an output signal to a receiver and a separate control device for generating test signals during fitting and sending control signals to the signal processor of hearing aid. The hearing aid adapted for in-situ fitting comprises at least an amplifier. Such systems and hearing aids are known from e.g. US-A-5 710 819.

Problem to be solved: the large dynamic range of the amplifier/signal processor needed to carry out a proper fitting for any person with an unspecified hearing loss.

Solution: enabling a shift of the output level range of the amplifier/signal processor resulting in a reduction of the inherent amplifier/signal processor noise.

As a consequence in-situ fitting can be carried out with normal hearing aid amplifiers which have a dynamic range smaller than needed for a proper fitting, since by the shift of the output level range the usable dynamic range during fitting is artificially expanded.

2. The problems addressed in JP-A-56 004 814 nor JP-A-05 250 058 (increase of the accuracy of a voltage dividing network and prevention of A/D conversion accuracy from being lowered by noise during conversion, respectively) are different from the problem solved in the application. Consequently confronted with the problem of the application a skilled person would not apply those teachings to any either one of WO-A-97 14 267 and DE-A-32 05 685.

Claims 2-11 and 13-16 are dependent on claims 1 and 12, respectively and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**Re Item VII**

**Certain defects in the international application**

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>IPB/25852</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/DK 99/ 00034</b>	International filing date (day/month/year) <b>25/01/1999</b>	(Earliest) Priority Date (day/month/year)
Applicant <b>TØPHOLM &amp; WESTERMANN APS et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

### 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2A

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

National Application No

PCT/DK 99/00034

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04R25/00 H04R29/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04R G06F H03F H03M G05F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	W0 97 14267 A (AUDIOLOGIC INC.) 17 April 1997 (1997-04-17) page 1, line 9,10  page 3, line 8 -page 4, line 2 page 4, line 11 -page 5, line 29 page 7, line 7-27 page 8, line 1-39 ---	1,2,4-6, 10,12 7,8,11, 15,16
Y A	DE 32 05 685 A (ROBERT BOSCH) 25 August 1983 (1983-08-25) page 3, line 19 -page 4, line 4 page 4, line 19 -page 5, line 10 ---	1,2,4-6, 10 8
	--- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

23 September 1999

Date of mailing of the international search report

30/09/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Zanti, P

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 5, no. 48 (P-055), 7 April 1981 (1981-04-07) & JP 56 004814 A (FUJITSU), 19 January 1981 (1981-01-19) abstract	1,2,4-6, 10
A	abstract	12-16
Y	PATENT ABSTRACTS OF JAPAN vol. 181, no. 1 (P-1671), 10 January 1994 (1994-01-10) & JP 05 250058 A (FUJITSU), 28 September 1993 (1993-09-28) abstract	12
A	EP 0 335 542 A (DIAPHON DEVELOPMENT) 4 October 1989 (1989-10-04) column 1, line 36 -column 2, line 17 column 4, line 2-49 column 5, line 5-56	1,3
A	EP 0 563 421 A (SIEMENS AUDIOLOGISCHE TECHNIK) 6 October 1993 (1993-10-06) column 1, line 1-6 column 3, line 13 -column 4, line 35 column 8, line 15-46	1,7
A	EP 0 360 917 A (SIEMENS) 4 April 1990 (1990-04-04) column 2, line 37 -column 5, line 46	1,8
A	WO 96 17493 A (TOPHOLM & WESTERMAN) 6 June 1996 (1996-06-06) cited in the application page 1, line 1-3 page 3, line 3-10 page 4, line 5 -page 5, line 19	1,9



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/DK 99/00034

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9714267	A	17-04-1997	AU 7118796 A EP 0890294 A NO 981562 A	30-04-1997 13-01-1999 09-06-1998
DE 3205685	A	25-08-1983	CH 662230 A DK 570882 A,B, JP 1703313 C JP 3062080 B JP 58151800 A US 4471171 A	15-09-1987 18-08-1983 14-10-1992 24-09-1991 09-09-1983 11-09-1984
JP 56004814	A	19-01-1981	JP 1431751 C JP 62036403 B	24-03-1988 06-08-1987
JP 05250058	A	28-09-1993	NONE	
EP 335542	A	04-10-1989	AU 3142089 A CA 1317666 A DE 68920060 D DE 68920060 T DK 152389 A JP 2043900 A JP 2664466 B US 4972487 A	05-10-1989 11-05-1993 02-02-1995 14-09-1995 01-10-1989 14-02-1990 15-10-1997 20-11-1990
EP 563421	A	06-10-1993	AT 154180 T CA 2092882 A DE 59208582 D DK 563421 T US 5378933 A	15-06-1997 01-10-1993 10-07-1997 29-12-1997 03-01-1995
EP 360917	A	04-04-1990	AT 99097 T DE 3886535 D US 5168556 A	15-01-1994 03-02-1994 01-12-1992
WO 9617493	A	06-06-1996	DE 4441996 A AT 166199 T AU 691001 B AU 2671495 A CA 2204757 A DE 59502189 D EP 0793897 A JP 10504155 T US 5878146 A	30-05-1996 15-05-1998 07-05-1998 19-06-1996 06-06-1996 18-06-1998 10-09-1997 14-04-1998 02-03-1999

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

NIELSEN, Kim Garsdal  
INTERNATIONAL PATENT-BUREAU  
23 Hoje Taastrup Boulevard  
2630 Taastrup  
DANEMARK

COPY

PCT

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing  
(day/month/year) 13.11.2000

Applicant's or agent's file reference  
IPB/25852

IMPORTANT NOTIFICATION

International application No.  
PCT/DK99/00034

International filing date (day/month/year)  
25/01/1999

Priority date (day/month/year)  
25/01/1999

Applicant  
T PHOLM & WESTERMANN APS et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer

Ikonen, T

Tel. +49 89 2399-7965



# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IPB/25852	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DK99/00034	International filing date (day/month/year) 25/01/1999	Priority date (day/month/year) 25/01/1999
International Patent Classification (IPC) or national classification and IPC H04R25/00		
Applicant T PHOLM & WESTERMANN APS et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  18/12/1999	Date of completion of this report  13.11.2000
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Nieuwenhuis, P  Telephone No. +49 89 2399 8968



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/DK99/00034

**I. Basis of the report**

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

**Description, pages:**

1-15 as originally filed

**Claims, No.:**

1-16 as originally filed

**Drawings, sheets:**

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/DK99/00034

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes: Claims 1-16
	No: Claims
Inventive step (IS)	Yes: Claims 1-16
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-16
	No: Claims

2. Citations and explanations  
**see separate sheet**

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. The application relates to a hearing aid system (claim 1) and a hearing aid (claim 12) both adapted for in-situ fitting. The system of claim 1 comprises a hearing aid with a signal processor for generating an output signal to a receiver and a separate control device for generating test signals during fitting and sending control signals to the signal processor of hearing aid. The hearing aid adapted for in-situ fitting comprises at least an amplifier. Such systems and hearing aids are known from e.g. US-A-5 710 819.

Problem to be solved: the large dynamic range of the amplifier/signal processor needed to carry out a proper fitting for any person with an unspecified hearing loss.

Solution: enabling a shift of the output level range of the amplifier/signal processor resulting in a reduction of the inherent amplifier/signal processor noise.

As a consequence in-situ fitting can be carried out with normal hearing aid amplifiers which have a dynamic range smaller than needed for a proper fitting, since by the shift of the output level range the usable dynamic range during fitting is artificially expanded.

2. The problems addressed in JP-A-56 004 814 nor JP-A-05 250 058 (increase of the accuracy of a voltage dividing network and prevention of A/D conversion accuracy from being lowered by noise during conversion, respectively) are different from the problem solved in the application. Consequently confronted with the problem of the application a skilled person would not apply those teachings to any either one of WO-A-97 14 267 and DE-A-32 05 685.

Claims 2-11 and 13-16 are dependent on claims 1 and 12, respectively and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/DK99/00034

**Re Item VII**

**Certain defects in the international application**

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

## PCT

### NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing:

27 July 2000 (27.07.00)

International application No.:

PCT/DK99/00034

Applicant's or agent's file reference:

IPB/25852

International filing date:

25 January 1999 (25.01.99)

Priority date:

Applicant:

ANDERSEN, Henning et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International preliminary Examining Authority on:

18 December 1999 (18.12.99)



in a notice effecting later election filed with the International Bureau on:

2. The election



was



was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38